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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of:
Darrin E. SMITH

Application No.: 10/678,228 Confirmation No.: 1580

Filed: October 6, 2003 Art Unit: 3724

For: GUIDE FOR WORKBENCH Examiner: C. T. Blake

CLAIM FOR PRIORITY AND SUBMISSION OF DOCUMENTS

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

Applicant hereby claims priority under 35 U.S.C. 119 based on the following prior foreign applications filed in the following foreign countries on the dates indicated:

Country	Application No.	Date
Canada	2437157	August 8, 2003
Canada	2407368	October 7, 2002

In support of this claim, a certified copy of each said original foreign application is filed herewith.

Dated: JUN - 7 2007

Respectfully submitted,

By_____

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Certification

La présente atteste que les documents ci-joints, dont la liste figure ci-dessous, sont des copies authentiques des documents déposés au Bureau des brevets.

This is to certify that the documents attached hereto and identified below are true copies of the documents on file in the Patent Office.

Specification and Drawings, as originally filed, with Application for Patent Serial No: **CA 2437157**, on August 8, 2003, by **DARRIN EUGENE SMITH**, for "Guide for Workbench".

Agent certificateur/Certifying Officer

May 28, 2007

Date

Canada

(CIPO 68)
31-03-04

OPIC CIPO

FIELD OF THE INVENTION

This invention relates to a guide for facilitating the adjustment of a piece of stock on a work bench and more particularly to a guide for adjusting the position of a piece of stock on a work bench in order to control the angle of cut into the stock by a power tool. The power tool may be a router, a power saw and the like.

BACKGROUND OF THE INVENTION

A piece of stock which is cut on a work bench usually contacts a fence along one of its sides. Along its oppositely facing side, the stock contacts a guide which serves to control the movement of the stock across the working surface. The guide is usually fitted with a tongue which slides in a groove. The groove conventionally extends laterally across the working surface. By means of the tongue, the stock can travel on a path which is parallel to the groove.

Many problems are encountered in controlling the stock in this manner. For the tongue to move smoothly in the groove, it cannot be too tight-fitting. The looser it is, however, the more subject the tongue is to vibration or oscillation. Such movement causes a like movement of the guide with a resulting loss in precision of the cut made by the power tool. Such movement also causes fatigue since the operator will feel the movement when his hands are on the guide.

Another problem which is frequently encountered is that the stock tends to bind in the cutter of the power tool as the stock is being moved across the working surface. The reason is that the groove in which the tongue of the guide travels is spaced apart from the cutter a signif-

icant distance to prevent it from interfering with the cutting operation. The guide, being attached to the tongue, is spaced apart an equal distance. The further the guide is from the point at which the stock is cut, the less effective it is in preventing unintended movement of the stock at that point. Such movement is usually the cause of binding.

A further problem is that as the cutter rotates, it urges the stock away from the fence and toward the guide. Because of the significant spacing between the cutter and the guide, the stock is difficult to control and unintended movement of the stock may occur.

SUMMARY OF THE INVENTION

I have invented a guide for controlling a piece of stock in a way that substantially overcomes these problems. The guide does not move in a groove but moves along a guide rod. Very little if any vibration or oscillation occurs as the guide moves. Moreover, the guide can be moved until it is very close to the cutter. In fact it can be moved over the cutter. Being so close, very little if any unintended movement of the stock occurs as it is being cut.

A further advantage of my guide is that as the stock is being cut, the cutter urges the stock into the fence and not into the guide. Since a fence is stationary during cutting, very little unintended movement of the stock is caused by the cutter.

The guide of my invention controls the angle of stock on a work bench equipped with a fence. Briefly, the guide includes: a base and a slider connected to the base and movable along the fence. A rotary element is mounted for rotation to the base and a backing block is mounted to

the rotary element for supporting the stock while it is on the working surface. There is means for releasably clamping the rotary element to the base to prevent the rotary element from rotating relative to the base.

DESCRIPTION OF THE DRAWINGS

The guide is described with reference to the accompanying drawings in which:

Figure 1 is a perspective view of the guide in conjunction with a work bench and a fence;

Figure 2 is an exploded perspective view of the components of the guide;

Figure 3 is a plan view of the guide, work bench and fence;

Figure 4 is another plan view of the same components as is Figure 3;

Figure 5 is a perspective view of a second embodiment of the base and rotary plate;

Figure 6 is an exploded perspective view of the base and rotary plate;

Figure 7 is an exploded perspective view of the lower wall of the rotary plate together with an insert attached to the lower wall;

Figure 8 is an elevation, partly in section, of the insert;

Figure 9 is a section, in enlarged scale, of a portion of the insert;

Figure 10 is a perspective view of the base;

Figure 11 is a section of the insert and base in which a detent is engaged; and

Figure 12 is another section of the insert and base in which the detent is disengaged.

Like reference characters refer to like parts throughout the description of the drawings.

DESCRIPTION OF PREFERRED EMBODIMENTS

With reference to Figures 1 and 3, the guide of the invention, generally 10, is mounted to a fence 11 which is mounted in grooves 12a,b at opposite sides of the working surface 14 of a work bench. Knobs 16 are each end of the fence are provided for locking the fence in grooves 12a,b so that the fence is stationary. The structure of the fence and the way in which it operates are conventional

A circular opening 18 is formed in the working surface through which the cutter (not illustrated) of a conventional power tool extends. The cutter may be a bit of a router or the blade of a power saw. The power tool, whether a router or a power saw, is mounted beneath the working surface.

A guide rod 20 is supported above the fence by brackets 22a,b which are attached to the rear wall of the fence. The guide rod extends horizontally along the length of the fence and supports a slider, generally 24. The slider has a sliding tube 26 having an internal passageway in which the guide rod is received. The sliding tube is freely slidable along the guide rod.

A stop 27 for the slider is mounted for sliding along the guide rod. With reference to Figure 3, the stop is composed of a ring 28 which encircles the guide rod and an adjusting screw 29 which passes through a threaded opening in the ring and into contact with the guide rod. Tightening of the screw into contact with the rod immobilizes the stop in the conventional manner. The stop serves to limit the length of travel of the slider.

As illustrated in Figure 2, the slider has a pair of spaced blocks 30a,b affixed to tube 26. The blocks rest on the upper edge of the fence as the tube slides along the guide rod. The blocks are connected to a side wall 32 which extends vertically downwardly and terminate at a base 34. The base extends horizontally outward from the side wall.

The base supports a rotary plate or element 36. The plate has an outer edge which is curved in part and otherwise is straight. The plate has an opening 38 for receipt of a fastener composed of threadably interconnected stud 40 and pin 42. The fastener serves to interconnect the plate and base so that the plate is rotatable relative to the base.

An upstanding rail 44 is attached to the plate adjacent to to the straight part of the plate. The rail is connected to a backing block 48 by means of twoor more pairs of threadably interconnected studs 50 and nuts 52. The nuts are received in a groove 56 in the backing block.

The groove has an interior large enough to allow the nuts to slide freely but the front opening of the groove is constricted so that the nuts cannot pass through the opening. The nuts thus hold the block to the rail but allow the block to slide relative to it. If, however, the studs are tightened to the nuts, the nuts will frictionally engage the walls of the groove which define the opening. The nuts will then prevent the block from sliding.

When the rail is attached to the backing block, the downwardly facing lower wall of plate 34 is preferably spaced above the working surface 14 of the work bench. As such, the operation of the plate will not be impeded by dust, sawdust and chips which collect on the working surface.

More preferably, the lower plate wall is spaced above the cutter of the power tool so that the cutter will not damage the plate when the plate moves over the cutter

A scale 60 is etched or painted onto the upper surface of the plate adjacent to its curved edge. The scale acts as a gauge to measure the angle of the plate relative to some line of reference. In Figure 1, the line of reference is on the plane of the front wall 11a of the fence. Since the plate is connected to the backing block, the gauge serves to measure the angle between the front wall 48a of the block against which the stock is placed, and the front wall 11a of the fence.

An arcuate groove 64 is formed in the plate. A handle 66 has at its lower end a threaded shank 68 which passes through the groove and into a threaded aperture 70 in the base. The handle serves as means for releasably clamping the plate to the base so that the position of the plate on the block is adjustable. Thus, by means of the handle, the piece of stock may be clamped in a fixed angular position relative to the fence.

The operation of the adjusting guide of the invention is as follows: With reference first to Figure 3, a piece of stock 72 is shown resting against backing block 48. The angle of the stock is adjusted by loosening handle 66 so that plate 36 can be rotated. Once the stock is in the desired position, the handle is tightened so that the plate is immovable relative to the base. The stock can then be moved laterally in the direction of arrow 76 by applying pressure to the adjusting guide to cause sliding tube 26 to slide along the guide rod in that direction. As the stock moves over open-

ing 18, it is cut by the cutter.

The stock can be moved longitudinally forward in the direction of arrow 78 by loosening knobs 16 to allow the fence to carry the guide forward.

When the cutting operation is complete, the guide can be moved out of the way by lifting handle 66. By so doing, the base and plate will rise and tube 26 will rotate about guide rod 20. Further lifting of the handle will cause the guide to swing over the fence and away from the working surface where it will not hinder any operation being carried out on the surface.

With reference to Figure 4, the angle of the fence can be adjusted by knobs 16 to allow for greater flexibility in the path of the guide.

With reference to Figures 5 and 6, blocks 80a,b attached to slider 82 are connected to side wall 84 by means of four socket head cap screws 86. The side wall is connected to base 88 as is rotary plate 90 by means of bolt 91 which allows the plate to swivel on the base. Handle 92 travels in arcuate groove 93 in the rotary plate and serves to releasably tighten the rotary plate to the base to prevent the plate from swivelling. Handle 66 and groove 64 in the previous drawings serve the same purpose.

Fixed to the upper wall of the rotary plate is a clamp 94. The clamp serves to attach rail 96 to the rotary plate and to prevent it from sliding relative to the plate. It does so by the following means. The rail has a T-slot 98 for sliding receipt of an elongated flat bar (not illustrated). The bar has threaded openings for receipt of threaded stems attached to knobs 100.

Rotation of the knobs in one direction causes the bar to rise into frictional contact with the upper wall of the T-slot and thereby immobilize the rail relative to the rotary plate. Rotation of the knobs in the opposite direction causes the bar to descend thereby allowing the bar to slide in the T-slot.

The rail is bolted to backing block 102. The block is movable in three ways. It is movable forward and back, it swivels clockwise and counterclockwise, and it slides to the right and to the left. The first movement occurs when slider 82 moves on the guide rod as previously described. The second movement occurs when handle 92 is loosened to allow the rotary plate to swivel about bolt 91. The third movement occurs when clamp 94 is loosened.

With reference to Figures 6 and 7, base 88 has a generally U-shaped opening 104 in its outer edge for receipt of the raised central area 106a of an insert 106. The two outer areas 106b,c of the insert are inset into the lower wall of the base and each has a slot for receipt of bolts 108 for attachment of the insert to the base. Outer area 106c has a scale 110 which projects beyond the outer edge of the base to permit fine adjustment of the rotary plate.

The central area of the insert has inner and outer holes 112, 114 formed in it. The outer hole has a cylindrical wall defined. at the top by a raised annular lip 116. The lower portion of the hole receives a metallic ball or ball bearing118, and immediately below it, a coil spring 120. The ball rests on the spring and is urged upwardly by the bias of the spring.

The inner hole 122 in the insert has a threaded inner wall for threadable receipt of a pin

124 for pivotally attaching a detent-disengaging plate 126 to the insert. A threaded locking key 128 holds the pin in position.

With reference to Figures 8 and 9, plate 126 has a slot 130 which when above the ball as illustrated in Figure 8, allows the upper wall of the ball to extend above the plate. The edges of the slot are spaced apart less than the diameter of the ball to prevent the spring from pushing the ball upwardly out of the slot.

With reference to Figure 9, when the detent-engaging plate pivots in the direction of the arrow, the slot is no longer above the ball and the plate forces the ball downward into the opening in the plate. The ball, accordingly, no longer projects above the plate.

A cavity 140 is formed in the lower wall of the plate. The side walls of the cavity engage annular lip 116 when the slot is over the ball as illustrated in Figure 8 and entirely over the ball as illustrated in Figure 9. The lip as such acts as stop points for the detent-engaging plate and ensures that the plate, while free to pivot, never pivots beyond the central area of the insert. Being always over the central area, the plate serves to confine the ball in hole 114.

The ball cooperates with the rotary plate and together they act as a detent to cause the rotary plate to swivel in predetermined increments on the base. Figures 10 - 12 illustrate the way in which the ball and plate cooperate in this way. With reference first to Figure 10, the detent-engaging plate 126 is marked with the words "on" and "off". Those words indicate when the detent is engaged and when it is disengaged. When engaged, slot 130 is over the ball and the ball

projects above the plate 126. When disengaged, the ball is confined below the plate.

With reference to Figures 7 and 11, arranged along an arc-shaped line 142-142 on the lower wall of the rotary plate 90 and spaced radially outwardly from arcuate groove 64 is a number of dome-shaped openings 146. The openings are spaced an equal distance apart from one other.

When the detent is engaged as illustrated in Figure 11, the ball is received in one of the openings 146. As the rotary plate swivels, the ball rolls out of that opening and rolls into the next on the arc. The ball therefore causes the rotary plate to move in fixed increments since when the ball is between each opening, the plate rolls on the ball and is unstable. The plate will eventually swivel to a point at which the ball finds its way into an opening

When the detent is disengaged as illustrated in Figure 12, the ball is below openings 146 and does not interfere with the movement of the rotary plate. At this time, the position of the rotary plate can be accurately set by means of scale 110. Handle 92 can then be tightened into engagement with the rotary plate in order to hold the plate in the desired position.

It will be understood, of course, that modifications can be made in the structure of the guide which is described herein without departing from the scope of the invention.

I claim:

1. A guide for controlling the angle of stock on the working surface of a workbench equipped with a fence, said guide comprising: a base; a slider connected to said base and movable along said fence; a rotary plate mounted for rotation to said base; a backing block mounted to said rotary plate for supporting said stock while on the working surface; and means for releasably clamping said rotary plate to said base to prevent said rotary plate from rotating relative to said base.

3. The guide of claim 1 wherein said rotary element is provided with a detent which causes said rotary element to move in predetermined increments as it rotates.

4. The guide of claim 1 wherein said rotary element is provided with a detent which causes said rotary element to move in equal increments as it rotates.

5. The guide as claimed in claims 3 and 4 further including means for disengaging said detent.

6. The guide as claimed in claim 1 further including means for slidably mounting said backing block to said rotary element such that the position of said backing block on said rotary element is adjustable; and means for releasably clamping said block to said rotary element for preventing said block from sliding relative to said rotary element.

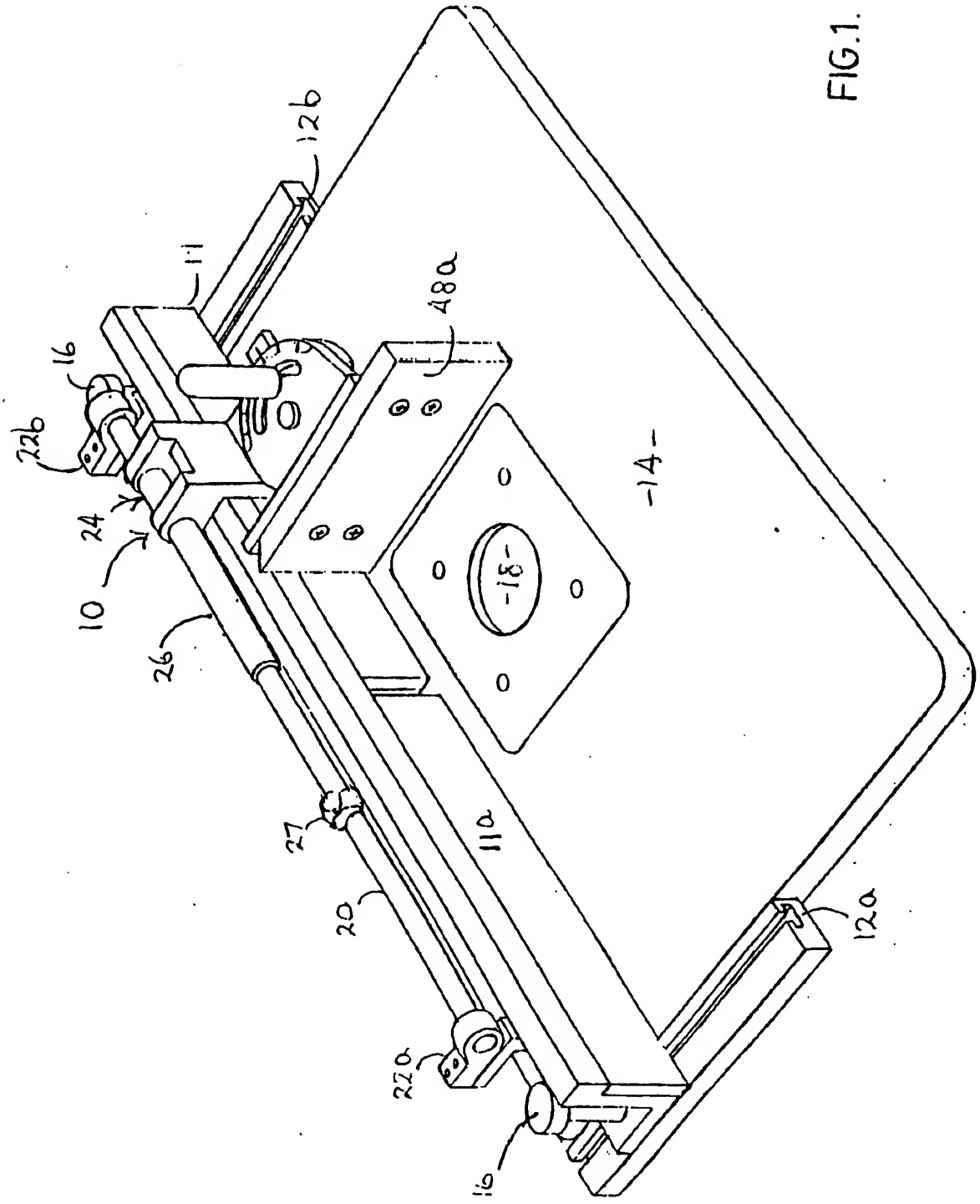

FIG.1.

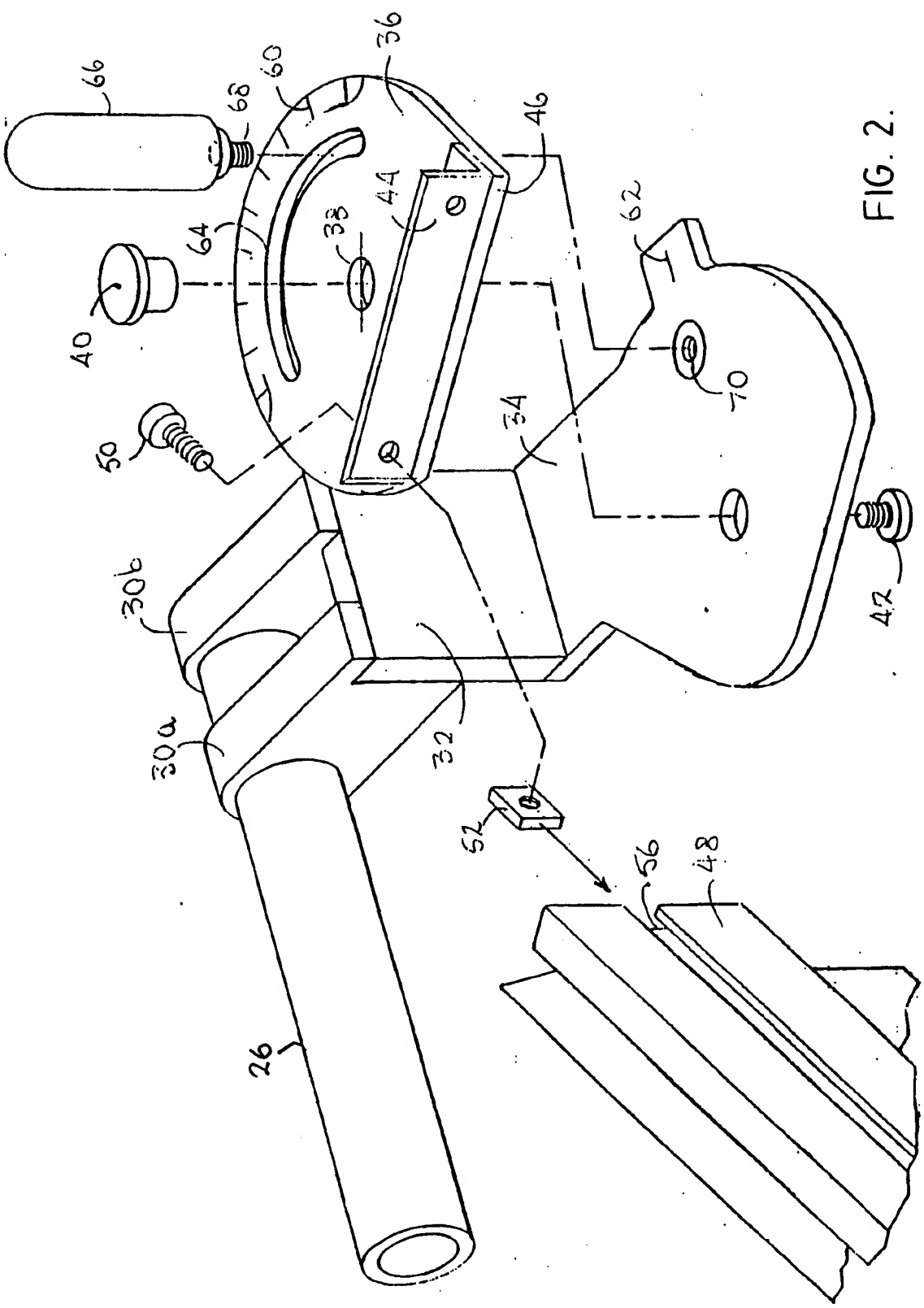

FIG. 2.

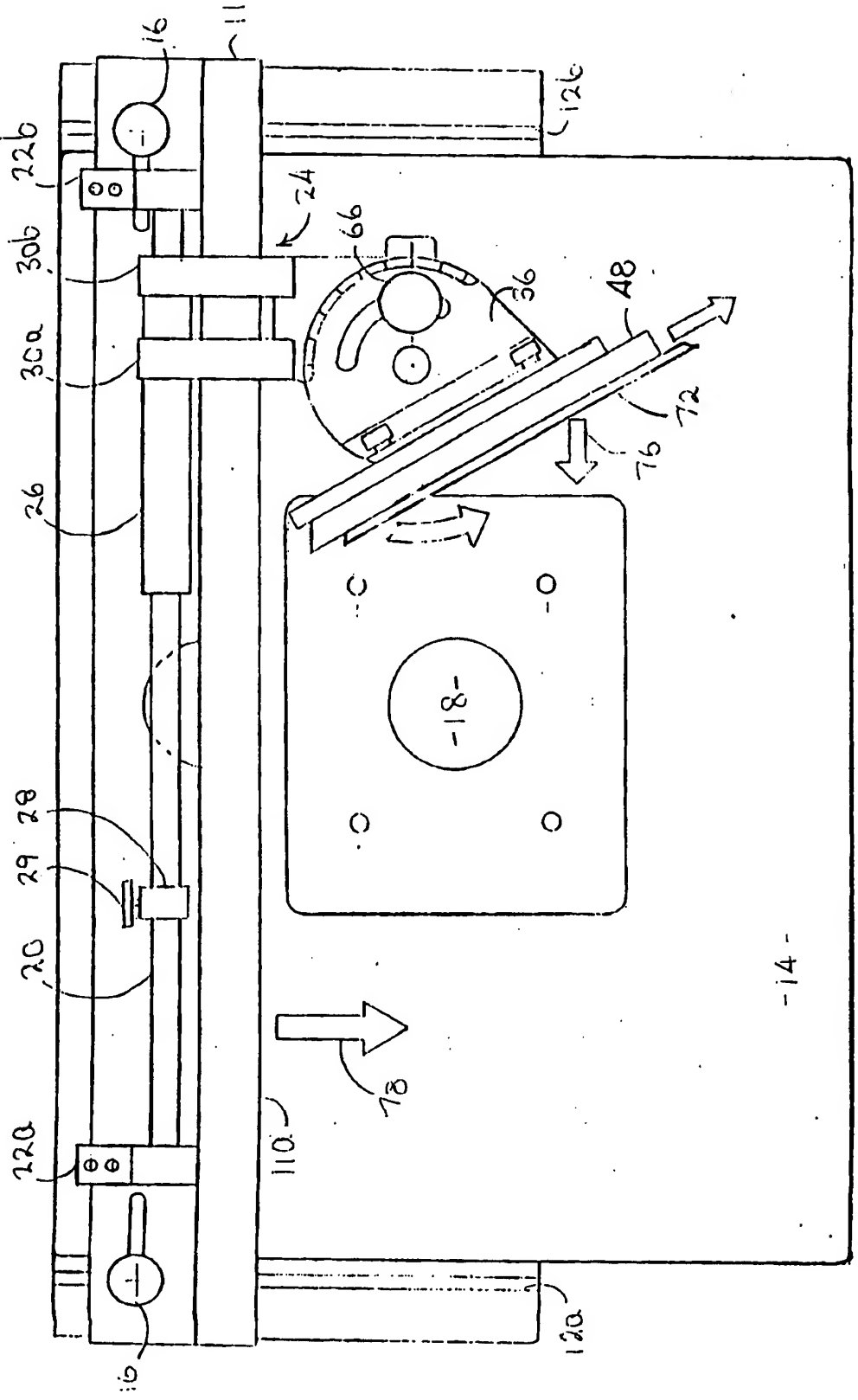
16
11
126
22b
24
66
36
48
30b
30a
72
76
26
-18-
28
29
20
78
110
22a
120
10
-14-

FIG. 3.

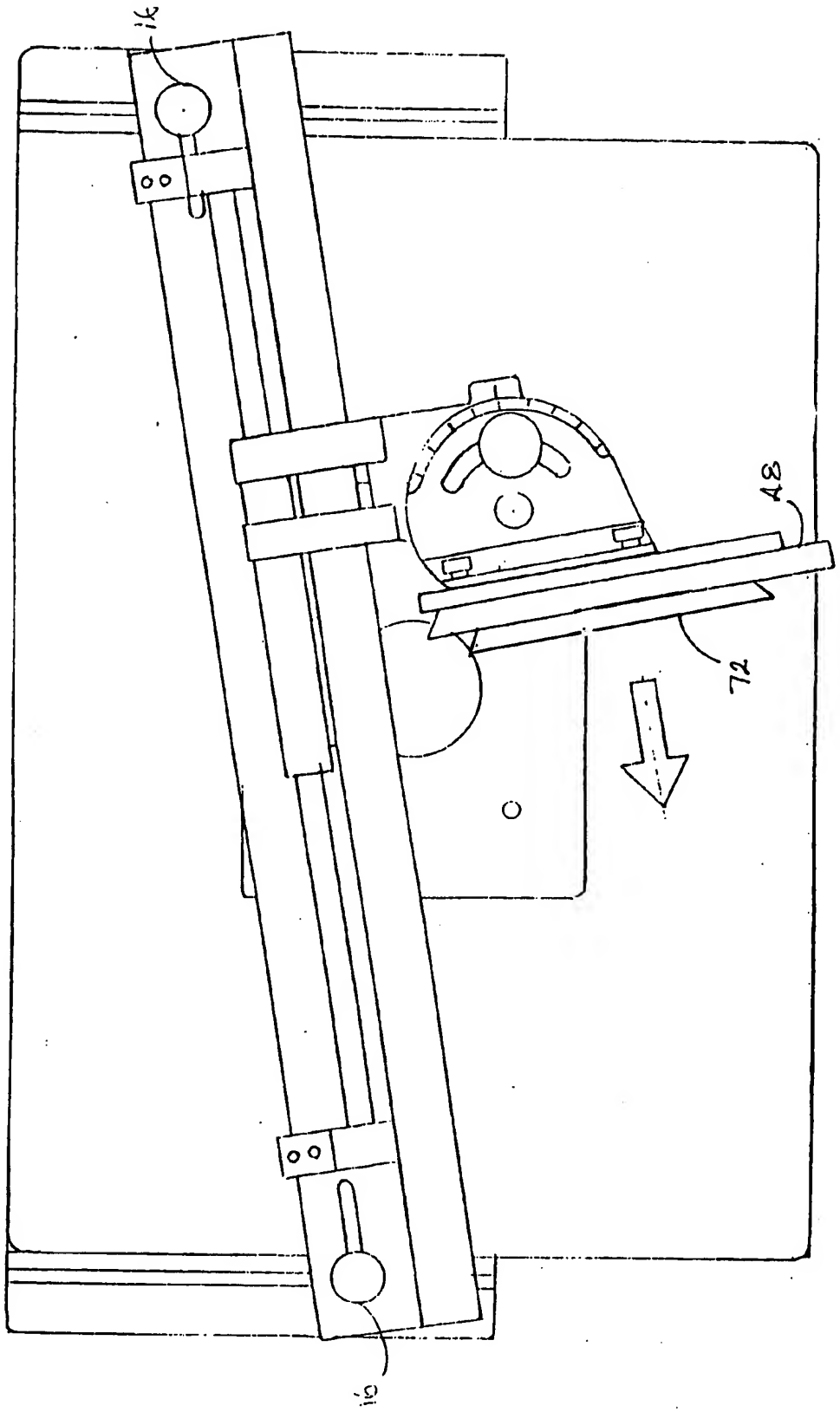

FIG. 4.

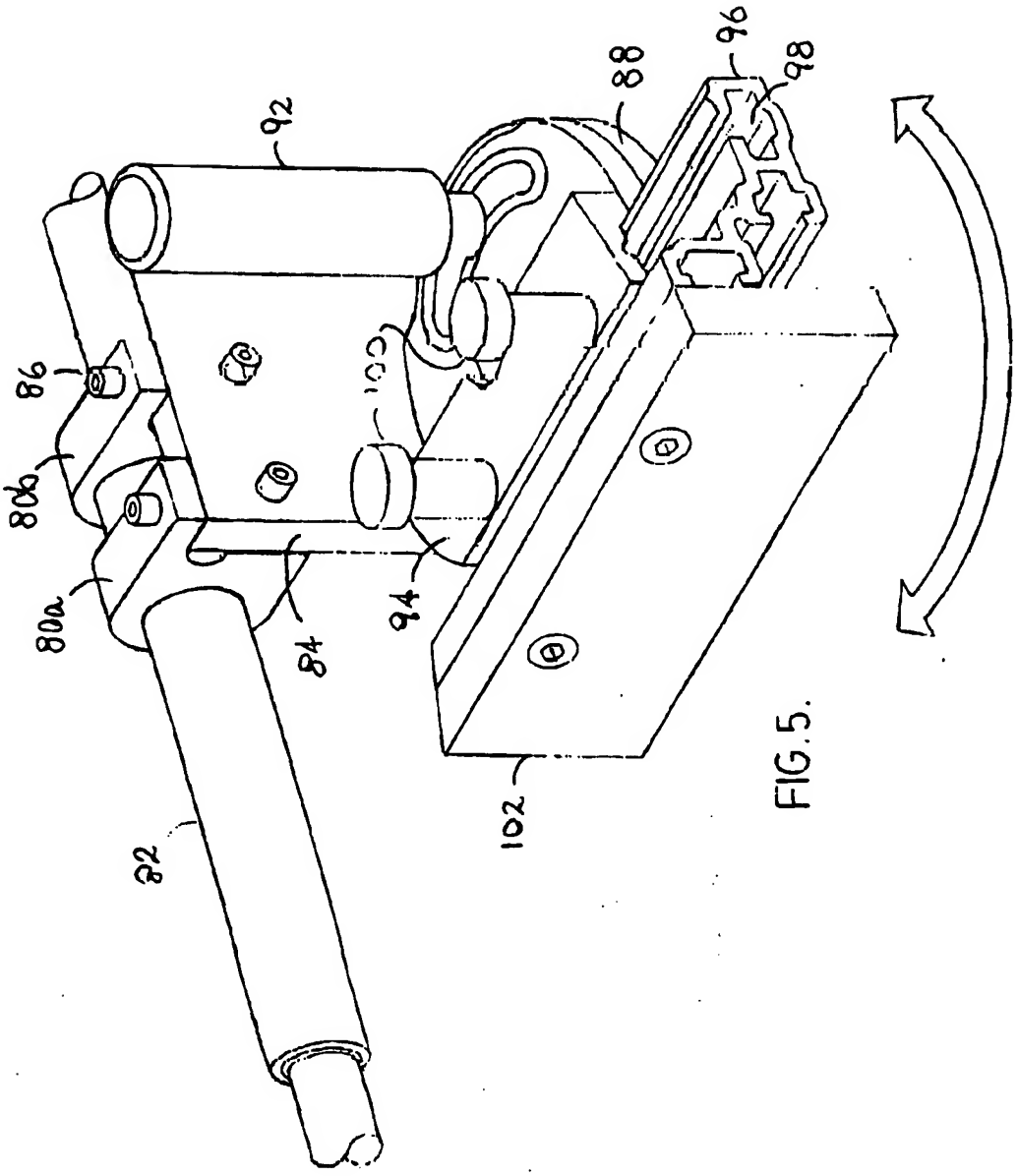

FIG.5.

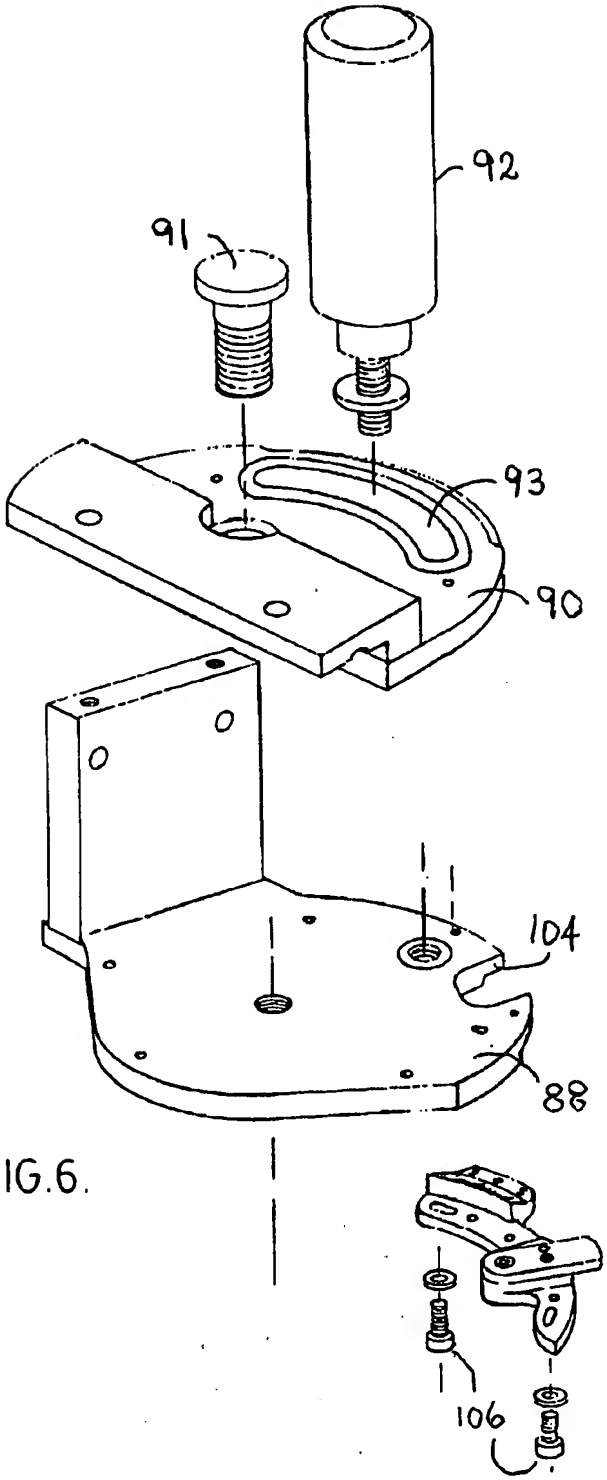

FIG.6.

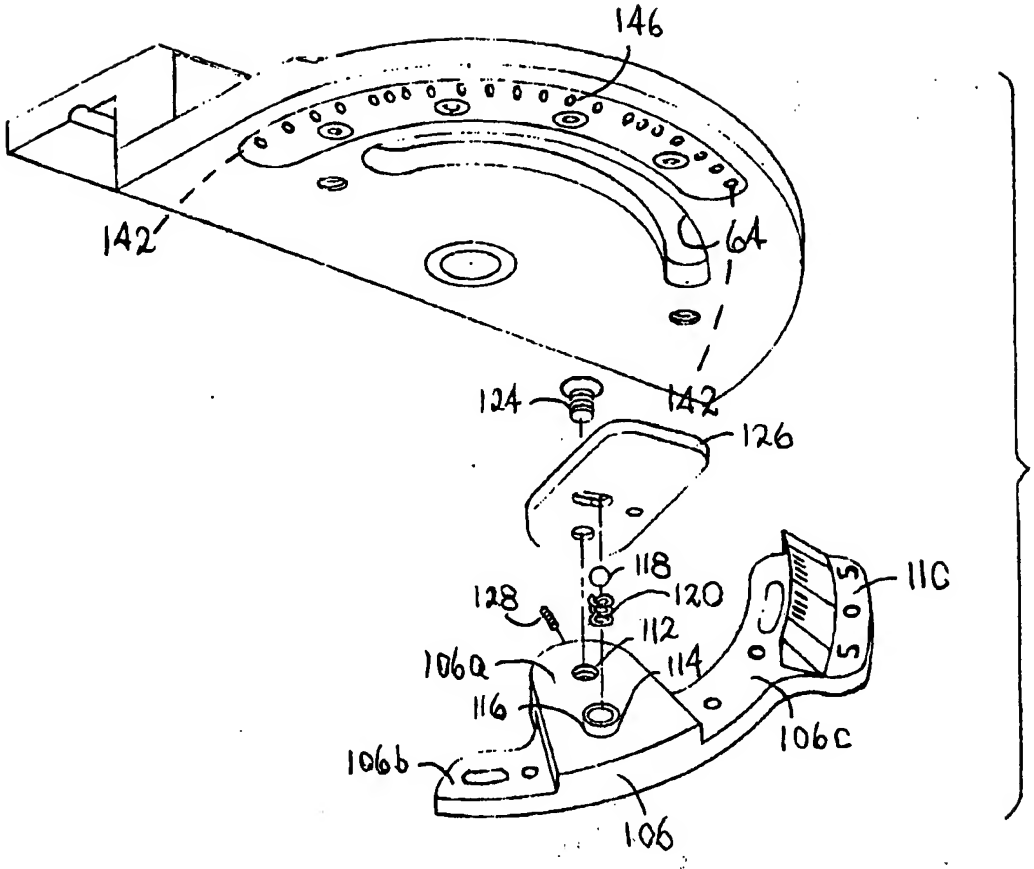

FIG. 7.

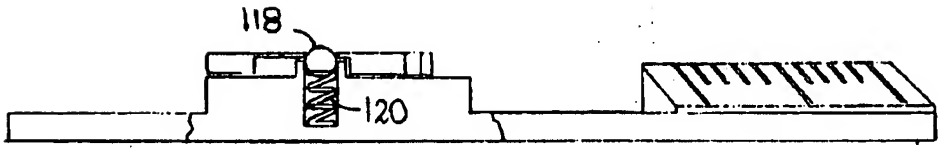

FIG. 8.

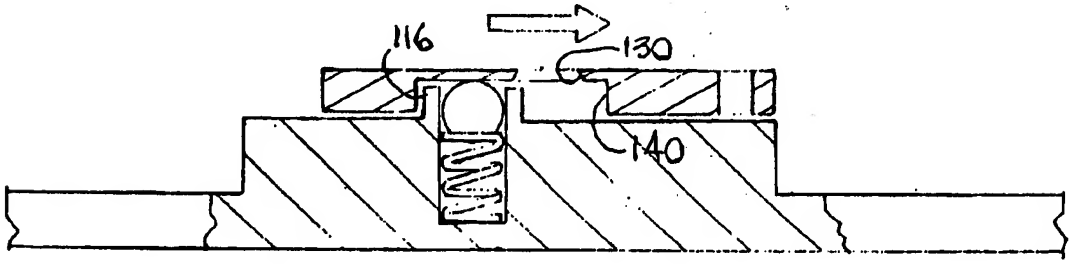

FIG. 9.

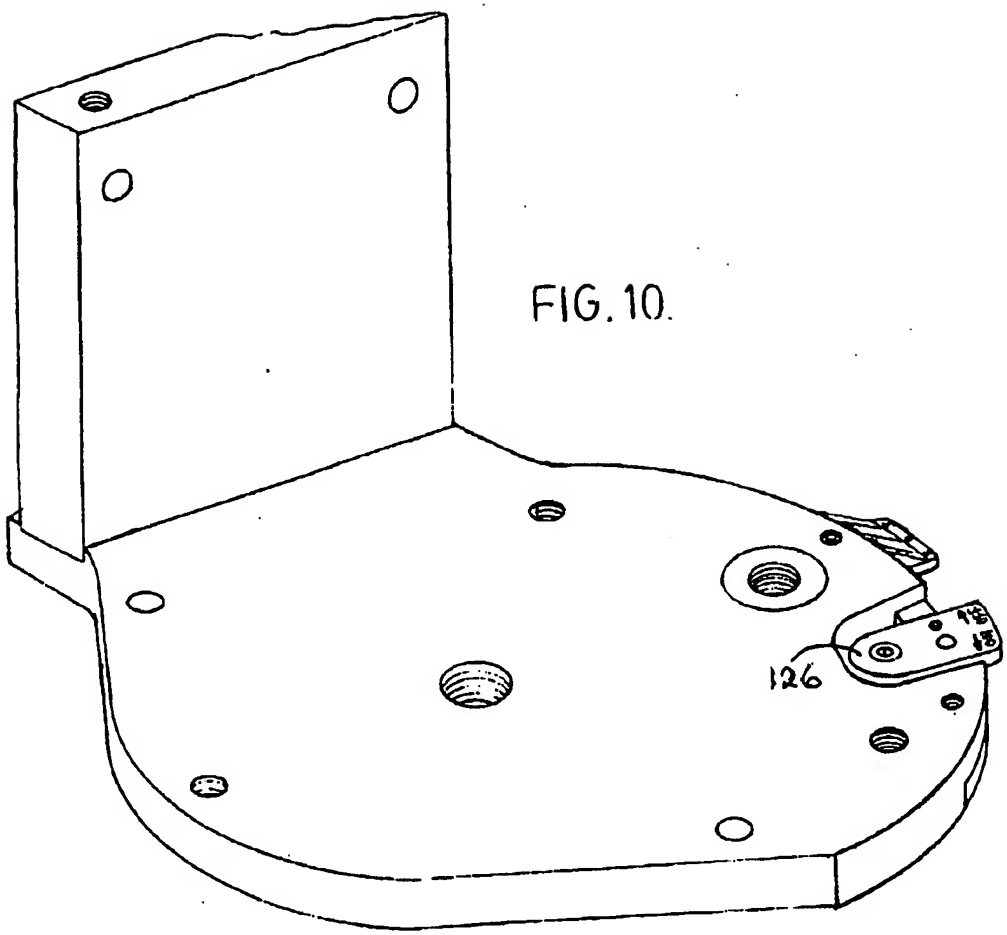

FIG. 10.

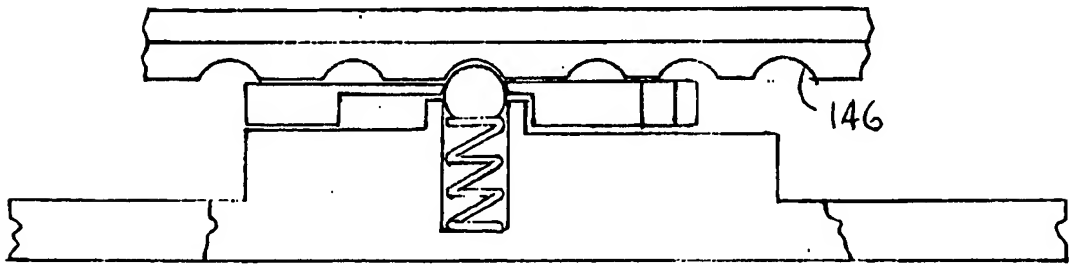

FIG. 11.

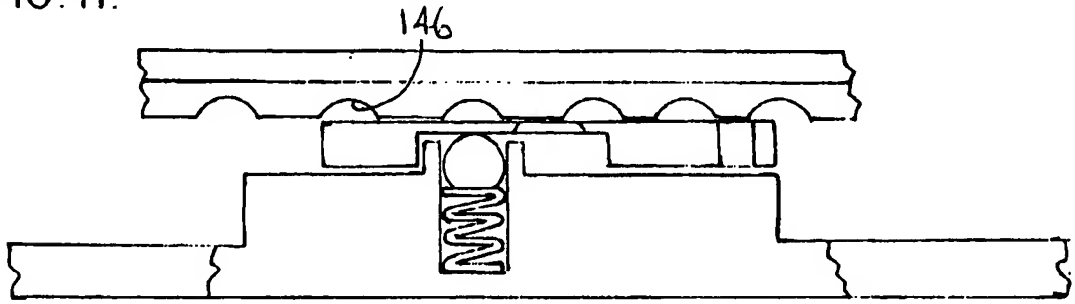

FIG. 12.